

SYMONS'S

MONTHLY

METEOROLOGICAL MAGAZINE.

CLXXIV.]

JULY, 1880.

PRICE FOURPENCE.
[or 5s. per ann. post free.]

WEATHER PREDICTION.

THE hot weather which Mr. Brumham expected to prevail at the end of June did not come, and some of our correspondents have made merry over the failure, and have blamed Mr. Brumham for making the prediction, and ourselves for printing it. Space is too valuable to be devoted to jokes, and we therefore print at the end of this notice only two letters, which are written in unexceptionable style, and which deal with facts.

We admit to the full the completeness of the failure, but we cannot understand the frame of mind which induces any meteorologist to see therein ground for rejoicing and merriment; to us it is quite the reverse.

It is our hope, and our belief, that besides the temporary purposes of civil life, to which they greatly minister, the meteorological observations now daily made at thousands of stations in all parts of the globe, will by a future and more deeply thoughtful generation be utilized for the investigation and determination of the probable character of coming seasons.

Such knowledge would be worth many millions of pounds per annum, and we think that those who without the remotest chance of personal recompense devote, as Mr. Brumham has done, weeks and months of their lives to seeking for this knowledge, deserve the sympathy and the support of those who wish well to their country.

There has been so much charlatanry about weather prediction, that it requires no ordinary courage to write anything upon the subject for publication, and it requires a little to publish such predictions, but the present utter failure does not in the slightest degree induce us to regret the space which during the last eleven years we have devoted to the subject. On the contrary, we ask our readers to carefully scrutinize the table on the next page, to examine all the original letters, to which we give full references; to test our description of the subsequent weather, and finally to say whether the following proportions are such as to call for the suppression of similar publications in future.

The table gives—

Successes	9, or 65 per cent.
Partial successes ...	2, or 14 per cent.
Failures	3, or 21 per cent.

or counting the partial successes, half with the successes and half with the failures, we have—

Successes	10, or 71 per cent.
Failures	4, or 29 per cent.

Even if the successes can be reduced (and we do not think that they can, for we have tried to be impartial), there will still remain such a preponderance in favour of the predictions, that we have decided that if Mr. Brumham will in due course favour us with his opinion respecting the probable character of the winter of 1880-81, we will find room for the letter.

ANALYSIS.

Published.	Spirit, or actual words of Prediction.	Subsequent weather at Greenwich.	Epitome.
1869, May 15. Vol. IV., p. 59.	A period of a month or more of dry weather should commence in the latter part of May.	The total rainfall from May 28th to July 28th was 1·29 in., or less than half the average.	<i>Success.</i>
1869, May 15. Vol. IV., p. 59.	Fine weather for harvest must set in on or about August 9th.	The total rainfall from Aug. 10th to Sep. 10th was 0·76 in., or less than half the average.	<i>Success.</i>
1869, Sep. 15. Vol. IV., p. 134.	“When the moon’s positions in declination have been the same as they will be in the coming <i>winter</i> , we have <i>always</i> had an unusually low temperature.”	The mean temp. of Dec. 1869, and of Jan. and Feb. 1870, were all below the average.	<i>Success.</i>
1870, Nov. 15. Vol. V., p. 179.	“According to a law which, since 1771, has <i>always</i> proved correct, the coming winter must be remarkably severe, that is, the mean temp. must be very considerably below the average.”	The mean temp. of Dec. 1870 was 6° below the average; Jan. 1871 was also very cold, and the mean of the two months lower than in any other years since 1830.	<i>Success.</i>
1871, June 15. Vol. VI., p. 84.	The summer rainfall should be above the average, and the season unsatisfactory.	The rainfall was above the average both in June and July, and the temp. below it. August was fine and hot.	<i>Partial Success.</i>
1871, Dec. 15. Vol. VI., p. 192.	“The winter should be somewhat warmer than the average.”	Mean temp. of the three winter months 3° above the average.	<i>Success.</i>
1871, Dec. 15. Vol. VI., p. 193.	The coming summer should be above the average.	Mean temp. of June, July, and August, 1°·6 above the average.	<i>Success.</i>
1872, Feb. 15. Vol. VII., p. 29.	The coming summer must be hot.		
1872, Dec. 15. Vol. VII., p. 204.	The winter on the whole must be an average one, but the mean temp. of February will probably be below the average.	Mean temp. of the three winter months 1° above the mean of 50 years, and just that of the last 25 years. The mean of Feb. was 4°·7 below the average.	<i>Success.</i>

ANALYSIS—(continued.)

Prediction.	Spirit, or actual words of Prediction.	Subsequent weather at Greenwich.	Epitome.
1873, May 15. Vol. VIII. p. 68.	The mean of the summer months should be below the 50 year average, but with considerable heat at the end of July or the beginning of August.	Mean of June just the average, July and August both above it, of the three months rather above it. July 21st to 23rd excessively hot.	<i>Partial Success.</i>
1873, Dec. 15. Vol. VIII. p. 179.	Winter will be rather severe, mean temp. below that of the last 33 years.	Mean temp. was rather (about 1°) above the 33 year mean.	<i>Failure.</i>
1873, Dec. 15. Vol. VIII. p. 179.	Summer will probably be cool, cooler than 1873.	Temp. just the average, and 1° cooler than 1873.	<i>Success.</i>
1874, Dec. 15. Vol. IX., p. 163.	The coming winter will be, at any rate, partly very severe.	Mean temp. of Dec. 7°·1 below 33 years mean, and of the three months 2°·1 below it.	<i>Success.</i>
1875, Dec. 15. Vol. X., p. 174.	The coming winter should be a very severe one.	Some spells of severe weather, but the mean only 0°·3 below the average.	<i>Failure.</i>
1880, May 15. Vol. XV., p. 56.	Very great heat should occur in the last three weeks of June.	Meantemp. just the average, and no extreme heat.	<i>Failure.</i>

To the Editor of the Meteorological Magazine.

SIR,—Being one of the numerous sceptical individuals referred to in Mr. Brumham's letter in the *Meteorological Magazine* for May last, I have, according to his request therein stated, carefully watched the weather of last month, and so far as this locality goes, the results have been contrary to Mr. Brumham's confident expectations.

Instead of bringing with it "great heat," the month of June, 1880, will be chronicled as having had a mean temperature 2° to 3° below the average. The lunar theory, after all then, is not to be depended upon.—Yours very truly,

H. COLBORNE.

St. Leonard's, July 1st, 1880.

To the Editor of the Meteorological Magazine.

SIR,—In a letter which appeared in your May number, your correspondent, Mr. Brumham, writing from Barnsbury, under date of April 30th, says, "according to a lunar law, to which I have frequently called attention, a wave of unusually great heat should pass over this part of England in the last fortnight or three weeks of June next."

As Mr. Brumham, in the same letter, pointedly invites the attention of your readers to his prediction, and asks them "to carefully watch the weather," in order to test the value of his lunar theory, he will not, I trust, think me ungracious if I point out that during the whole of the period in question the temperature all over England was below the average, and the weather unsettled and showery, with very heavy local thunderstorms in the last week.

From the official weekly summaries issued by the Meteorological Office, it appears that the mean temperature for the week ending June 14th was as much as 6° *below* the average in the E., S.W., and Midland districts, and 5° below in the N.W., N.E., and S. districts, while in the two following weeks the deficiency of temperature varied between 3° and 1° , the only exception being in the N.W. district, where the mean temperature for the week ending June 21st just equalled the average. And it further appears that at no single one of the fifty and odd British stations from which the official statistics are gathered, did the maximum temperature in shade even once rise to 80° during the three weeks in question, while at several stations it did not even touch 70° . In a word, the period referred to in Mr. Brumham's communication, instead of being one "of very great heat, or of remarkably fine warm summer weather," has been characterized throughout the whole of England, and especially in that part of it to which Mr. Brumham's forecast more particularly refers, by cloudy skies, deficiency of temperature, and excess of rainfall.

I will not now further trespass on your space, except to express my profound distrust of weather predictions based on "lunar" and other "laws of the weather" such as that enunciated by Mr. Brumham, and indeed of all weather predictions which overpass the limits of the modest official "forecasts." But I hope, with your permission, to return to this subject, and, in a future number of your magazine, to give some reasons for my scepticism.

I am, Sir, yours, &c.,

G. T. RYVES, F.M.S.

Team Vicarage, Stoke-on-Trent, July 7th, 1880.

[We shall be happy to receive the communication herein offered.
—ED.]

THE METEOROLOGICAL SOCIETY.

The last ordinary meeting of this society for the present session was held on Wednesday, the 16th ult., at the Institution of Civil Engineers, Mr. G. J. Symons, F.R.S., president, in the chair. T. W. Barry, M.D., A. W. Martin, and C. E. Peek were elected Fellows, and Senor A. Aguilar and Dr. H. H. Hildebrandsson were elected Honorary Members of the Society.

The following papers were read :—

1. "Ozone in Nature, its Relations, Sources, and Influences, &c." from 15 years' observations ashore and afloat, under all conditions of climate, by J. Mulvany, M.D., R.N.—The Meteorological elements with which ozone is most intimately associated are such as occasion high vapour tension and a high degree of saturation : therefore it is promoted by wind passing over a large aqueous expanse, and by heat producing rapid evaporation. Hence heat, if humid, is no bar to atmospheric ozonisation, but no definite relation exists in the

atmosphere between heat *per se* and ozone ; its relation to humidity is more definite and direct, but subject to many exceptions ; in consequence of this relation, it most abounds where its chemical qualities render it most useful. It appears to be formed in the upper strata and to be carried downwards by rain drops whose office is vehicular. The spherules of water which constitute clouds and have their origin in radiation and condensation have a similar office. Ozone does not appear to diffuse readily downwards, so that when the lower strata are robbed of ozone, by jungle, &c., a considerable difference in the ozonic condition close to, and at 170 ft. above, the surface may exist. The author is of opinion that no disease can be clearly traced to ozone as met with in the atmosphere.

2. "The Average Height of the Barometer in London." By Henry Storks Eaton, M.A., F.M.S.

3. "Note on a Waterspout observed at Morant Cays, Jamaica, March 23rd, 1880." By Lieut. Alfred Carpenter, R.N., F.M.S.

4. "Account of a Balloon Ascent from Lewes in a Whirlwind, on March 23rd, 1880." By Capts. James Templer and H. Elsdale.

5. "Results of Meteorological Observations made at Stanley, Falkland Islands, 1875-77." By William Marriott, F.M.S.

6. "A New Thermograph." By William David Bowkett.

7. "The Winter Climate of Davos." By C. T. Williams, M.D., F.M.S. Among the high altitude sanatoria of Europe, Davos at present enjoys the greatest reputation, partly on account of its accessibility and partly on account of certain peculiarities of position and shelter. The valley of Davos lies in the canton of the Grisons, between the valleys of the Lower Rhine and the Upper Engadine. The valley runs from N.N.W. to S.S.E., for about ten miles in length, with an average breadth of about a third of a mile, being for the most part of this extent a plain, gently sloping towards the north, and varying in elevation from 5400 to 4500 feet. Davos Platz is 5105 feet above the sea level. The author discusses the observations made during the four winters of 1876-7 to 1879-80. The peculiar effects of Davos Winter Climate seem to depend on—
1. The rarefaction of the atmosphere ; 2. Its dryness ; 3. The absence of strong currents, owing partly to shelter, and partly to the uniform layer of snow spread around ; and 4. The large percentage of the *direct* solar rays reaching the locality owing to the rarefaction of the air, and also the considerable amount of heat reflected from the extensive snow plain in front of the village of Davos Platz.

ERRATA IN THE TABLES OF MONTHLY RAINFALL IN METEOROLOGICAL MAGAZINE, VOL. XIV.

In our last volume the monthly fall of rain was given for one hundred and thirty-eight stations ; there were, therefore, about 1600 monthly values printed. These have now all been checked against the annual returns from the same stations, previous to their publica-

tion in *British Rainfall*, 1879, and the following 18 errors have been detected. This is far too many; both our readers and ourselves are so much indebted to the observers who furnish these returns that we are reluctant to state what proportion of these 18 errors belongs to our correspondents, and what to ourselves. It is impossible for us to be more careful than we are; we trust that our observers will be equally anxious to avoid appearing in the corresponding list next year.

Page.	Month.	Station.	Wrong. in.	Right. in.	Page.	Month.	Station.	Wrong. in.	Right. in.
10	Jan.	Hastings	2.59	3.77	94	June	Loch Leven	5.00	5.10
"	"	Strathfield Tur.	3.24	3.63	117	July	Cahir	2.10	2.30
11	"	Warrenpoint	4.35	4.32	118	"	Loch Leven	4.10	4.70
28	Feb.	Unthank Hall.	2.55	2.52	165	Oct.	Crossmolina	2.88	2.93
46	Mar.	Galway	2.16	2.53	"	"	Dowra	3.10	3.04
55	Apr.	Douglas	2.18	2.11	182	Nov.	Culloden	2.74	2.79
77	May	Carno	2.07	2.35	184	"	Tralee	.50	.68
"	"	Dowra	2.85	2.89	194	Dec.	York	1.24	1.12
78	"	Arnccliffe	2.08	2.03	"	"	Galway	3.13	3.22

THE WEATHER IN JUNE.

Generally overcast and very showery weather prevailed over England during the first week of June, while in Ireland and Scotland it was moderately fine.

Atmospheric pressure which had been high in the northern half of Western Europe during the first two days of the month, gave way very rapidly on the 3rd, upon the advance of two large depressions from the Atlantic—one to the north of Scandinavia, the other to Northern Germany; the anticyclone shifting to the westward. On the 5th a fresh depression appeared in the north, and pressure decreased everywhere except over the south-western coast of these islands. On the 7th this depression extended from the Shetlands to the western shores of the Baltic; thus causing the area of high pressure to move southwards until it was over the south-west of France, and north coast of Spain.

Temperature was less than the average throughout these Islands. The largest deficit from the mean was 7°·5 at Rothamsted and Churchstoke, and 7°·2 at Birmingham; the nearest approach to the mean was in the south of Ireland. The highest of the maxima (72° at Barrow-in-Furness, and 71° at Glasgow) occurred on the 3rd. Low min. readings were registered in all districts: during the early morning of the 5th the min. in the shade fell to about 35° in nearly all parts of Great Britain; at many inland towns sharp ground frosts were experienced.

Rainfall more than the mean except in S.W. England, W. Scotland, and S. Ireland.

Bright sunshine showed a decided decrease in England, but a slight increase in Scotland and Ireland. The duration varied from 73 hours at Glasgow, and 69 hours at Glenalmond, to 23 hours at Cambridge, 22 hours at Churchstoke, and 19 hours in London. The value for London is only 17 per cent. of the total possible duration.

Rather cloudy, and sometimes very dull and very showery, weather characterized the following week (8th–14th). Thunderstorms were reported from several towns both at the beginning and close of the week.

The above-mentioned anticyclone, with slight modifications and alteration of position from day to day, held good over France until the 14th, when it shifted to over Ireland, while a shallow depression succeeded to its place. The depression over Scandinavia (above-mentioned), gradually became shallower, finally disappearing on the 11th. Readings were extremely uniform over Western Europe on the 10th; indeed, on no day was the variation of pressure greater than half an inch.

Temp. again below the mean over the whole of these Islands. In E. Scotland the deficit was only 2°, but from 5° to 7° elsewhere. The ther. was for the most part highest on the 12th or 13th, when 75° was recorded at Nottingham and Cambridge; the minimum took place on the 9th or 10th.

Rainfall a little above the average in N.E. and N.W. England, and over Ireland; equal to the mean in S.W. England; a little less than the average elsewhere. The largest falls were 2·01 inches at Valentia and 1·50 at Markree Castle; the slightest were 0·08 inch at Birmingham and 0·13 at Cambridge.

Bright sunshine was of longer duration than in the previous week, except in Scotland, whence a decrease was reported. Max. duration, 75 hours at Valentia, and 72 hours at Markree Castle; min. duration, 35 hours at York, and 31 hours in London.

The sky was very cloudy and the weather very changeable, except in Scotland and the extreme North of England during the next week (15th-21st).

In the morning of the 15th a depression appeared over N. Germany and advanced in a westerly direction till, on the 16th, it was over the Straits of Dover. Consequently the bar. fell over nearly the whole of these Islands and France, while in the countries to the eastward of the North Sea a recovery began. By the following day the depression had travelled away in a S.W. direction to the Bay of Biscay, and the bar. rose over the whole of Europe. Next day it fell over the whole of W. Europe, but there was little difference in the general distribution of pressure.

On the 20th a depression advanced from the Atlantic to the S.W. coasts of these Islands, and several shallow subsidiary depressions lay over Ireland, W. and S. England; the weather being very showery and cloudy generally, except in the Netherlands and Scandinavia. Next day the bar. was changing rather irregularly; rising in the east of France, the Netherlands, and the greater part of England; falling elsewhere. Readings were rather low over W. Europe generally, and especially over our western coasts.

Temp. was slightly above the average in N. Ireland and W. Scotland, equal to it in N. Scotland and N.W. England; but elsewhere less than the average. The max. was 78° at Manchester, 76° at Nottingham, Cirencester, and Ardrossan; the min., 37° at Silloth and Markree Castle.

Rainfall less than the mean in Scotland, equal to it in S.W. England, below it elsewhere. Heaviest falls, 1·92 inches at Hurst Castle, and 1·52 at Hereford; lightest fall, 0·03 inch at Nairn, and 0·09 at Glasgow.

Bright sunshine showed a decrease, except in Scotland. Max. duration, 66 hours at Glasgow, and 58 at Glenalmond; min. duration, 26 hours at Cirencester, and 23 hours at Falmouth.

Changeable weather distinguished the last week of the month. Heavy thunderstorms occurred over the Midland and Eastern Counties on the 22nd, 23rd, and 24th, and in the South on the 25th and 26th. A good deal of fog was reported from Scotland on the 22nd and 26th.

On the 22nd barometric readings were very uniform over the British Isles, but an area of high pressure was shown over Spain, and an area of low pressure over Lapland. Next day the bar. fell decidedly in western France, but rose elsewhere, except in the Netherlands and the east of France, where it rose. Pressure remained highest in the south-east of France. A depression advanced to the extreme north of Scandinavia on the 26th, and one of lesser dimensions to France. The advance of the latter depression caused a total break-up of the anticyclone over France; and one was established over Ireland, where pressure increased rapidly. During the following day (27th), a large depression advanced to the north of Scotland, so that a brisk fall of the bar. began in Norway. Over France and the greater part of these Islands, however, the mercury rose, a large anticyclone being formed over France and the Channel. The centre of the depression moved deliberately from the Shetlands to Norway on the 29th, while the area of high pressure shifted somewhat to the eastward, and became less marked. The bar. fell a little, very generally on the 30th, and both depression and anticyclone had in great measure disappeared.

Temp. during the last ten days of the month was slightly above the average in Scotland, but below it in England and Ireland. The highest temp. occurred in N.E. England, some parts of the Midland Counties, and W. Scotland on the 22nd, but in the southern part of England it was registered towards the close of the period. The minimum was 42° at Glenalmond, and 43° at Durham and Cirencester.

Rainfall rather less than the mean in E. Scotland, N.E. and S.W. England, about equal thereto in S. Ireland, above it elsewhere. The heaviest falls reported were 3 inches at Nottingham, 2·01 inches at Laudale, and 1·99 at Oxford. At Leith, Pembroke, Barnstaple, and Plymouth, the total fall was less than one-tenth of an inch.

Bright sunshine was in the Midland Counties, S. and S.W. England, more frequent than in the week immediately preceding, but elsewhere there was a considerable decrease. Maximum duration, 61 hours at Pembroke; minimum duration, 14 hours at Armagh, 16 hours at Dublin, at York 18 hours, and at Durham 19 hours.

Lowestoft.

H. E. M.

PHENOLOGICAL OBSERVATIONS, 1879.

Extracted from the records sent along with the returns of the fall of rain.

JANUARY.

17th. (II.) *St. Lawrence*. Winter aconite in flower.

FEBRUARY.

5th. (II.) *St. Lawrence*. Snowdrops in bloom.

6th. (II.) *St. Lawrence*. Thrush and blackbird heard.

16th. (II.) *St. Lawrence*. Yellow crocus in bloom.

18th. (II.) *Eastbourne*. Primroses first seen.—(II.) *St. Lawrence*. Peacock butterfly seen.

MARCH.

1st. (II.) *Littlehampton*. Blackbird first heard.

3rd. (II.) *Addiscombe*. Yellow crocus in flower.

5th. (III.) *Cambridge, Merton Villa*. Sulphur butterfly seen.

6th. (II.) *Addiscombe*. A double snowdrop in flower.—(II.) *St. Lawrence*. Gossamer spider web abundant.—(IV.) *Diss*. First wild primrose.

8th. (IX.) *Stanley Vicarage*. Crocus in flower and bees out.

10th. (II.) *St. Lawrence*. Peacock, tortoiseshell, and white butterflies seen.

13th. (IX.) *Stanley Vicarage*. Thrushes singing in trees covered with snow.

21st. (II.) *Addiscombe*. An early apricot on a south wall in flower, 17 days later than in 1878.—(II.) *St. Lawrence*. Gooseberries in leaf.

22nd. (II.) *St. Lawrence*. First cowslips.

31st. (II.) *Addiscombe*. A *Pyrus japonica* on an east wall in flower.

APRIL.

4th. (I.) *Pinner Hill*. Swallows first seen.

5th. (II.) *St. Lawrence*. Pair of swallows seen.

7th. (XII.) *Melrose*. Apricot blossom out.

10th. (II.) *Addiscombe*. A peach, and also a nectarine, on a south wall in flower.

- 15th. (II.) *St. Lawrence*. Nightingales singing.
 16th. (III.) *Addington*. Cuckoo heard.—(XII.) *Melrose*. Cherry blossom out.
 17th. (V.) *Alderbury*. Cuckoo heard.—(VII.) *Langton*. Cuckoo seen.
 18th. (I.) *Pinner Hill*. Cuckoo heard.—(II.) *St. Lawrence*. Wryneck heard.—(XX.) *Newcastle West*. First swallows seen.
 19th. (I.) *Pinner Hill*. Wryneck heard.—(III.) *Addington*. Swallows seen.—(IX.) *Stanley Vicarage*. Cuckoo heard.
 20th. (II.) *Addiscombe*. A polyanthus in a north border in flower, nearly 2½ months later than in 1878.—(III.) *Cambridge*. Swallows seen.—(IV.) *Diss*. Cuckoo and nightingale heard.
 21st. (IV.) *Diss*. Swallow seen.
 22nd. (II.) *St. Lawrence*. Cuckoo heard.—(VII.) *Coston*. Cuckoo first heard.
 23rd. (V.) *Alderbury*. Nightingale heard.
 24th. (III.) *Cambridge*. Nightingale and cuckoo heard.—(V.) *Alderbury*. Swallow seen.
 25th. (XII.) *Melrose*. Swallows first seen.
 26th. (I.) *Pinner Hill*. Nightingale heard.—(II.) *St. Lawrence*. *Stellaria* in bloom.
 27th. (VI.) *Cheltenham*. Cuckoo heard.—(VII.) *Langton*. Swallow seen.
 28th. (II.) *St. Lawrence*. Blackthorn in bloom.—(VI.) *Sansaw*. Swallows first seen.
 30th. (II.) *Addiscombe*. A single wallflower in a north border in flower, quite 3½ months later than in 1878.

MAY.

- 2nd. (II.) *St. Lawrence*. Blue bells in flower.
 5th. (II.) *Hythe*. Swifts arrived.—(II.) *St. Lawrence*. Pears in bloom.
 8th. (II.) *Addiscombe*. Single gorse in flower.
 12th. (II.) *Addiscombe*. An espalier pear-tree and a morello cherry-tree on a north wall in flower.—(X.) *East Layton*. First swallow seen.
 15th. (II.) *St. Lawrence*. Swifts seen.
 17th. (IX.) *Stanley Vic.* Landrail first heard.
 19th. (II.) *St. Lawrence*. Purple lilac in bloom.—(X.) *East Layton*. Whitethroats seen.
 21st. (II.) *St. Lawrence*. First swarm of bees.
 23rd. (X.) *East Layton*. Flycatchers arrived.
 24th. (II.) *St. Lawrence*. First piece of May in bloom.
 27th. (II.) *St. Lawrence*. Damsons in bloom.

JUNE.

- 2nd. (II.) *Addiscombe*. Purple lilac in flower.
 4th. (V.) *Babbacombe*. Immense numbers of the painted lady butterfly were seen about the 4th, but were in bad condition.
 28th. (II.) *St. Lawrence*. Grass cut for hay.
 30th. (VI.) *Cheltenham*. Currants on wall only just ripening.

JULY.

3rd. (II). *Addiscombe*. One of my roses, a *Blairii*, came first into bloom, or more than five weeks later than in 1878. *Syringa* in flower.

10th. (II). *Addiscombe*. Honeysuckle in flower.

17th. (II). *Addiscombe*. Privet in flower.

AUGUST.

15th. (II). *Addiscombe*. Every leaf on the whole of the white and red currant and gooseberry bushes in my garden had before this date been eaten up by the gooseberry-caterpillar.

SEPTEMBER.

8th. (II). *Addiscombe*. A *sedum spectabile* in flower.

13th. (II). *Addiscombe*. First ripe peach picked from a south wall.

20th. (V). *Babbacombe*. Harvest completed.

OCTOBER.

11th. (IV). *Diss*. Harvest generally over.

NOVEMBER.

4th. (II). *Addiscombe*. Cut 23 rose-blooms, two of which were as fine as any I have gathered this year.

7th. (IX). *Wakefield, Stanley Vic.* Beautiful day; starlings singing.

13th. (II). *Addiscombe*. Minimum temperature, $33^{\circ}0$, and on grass $23^{\circ}6$; all my dahlias killed; more than a fortnight earlier than in 1878.

14th. (II). *Addiscombe*. Minimum temperature, $27^{\circ}5$, and on grass $16^{\circ}2$. Flowers of a *Gladiolus Brenchleyensis* destroyed.—(X). *East Layton*. Peaches still on the tree, and *Gloire de Dijon* and sweet scented clematis in bloom.

16th. (II). *Addiscombe*. Minimum temperatures, $21^{\circ}2$, and on grass, $12^{\circ}4$. All my everlastings (*helichrysums*) fell victims to this frost.

17th. (II). *Addiscombe*. Cut the last rose of the year, or nearly three weeks later than in 1878.

18th. (II). *Addiscombe*. A Christmas rose in a north border in flower.

DECEMBER.

15th. (IX). *Stanley Vic.* Starlings singing.

REVIEW.

Results of Meteorological Observations made at the Bath Royal Literary and Scientific Institution during Ten Years commencing March, 1865.

By the Rev. L. BLOMEFIELD, M.A., F.L.S., &c. (From the Proceedings of the Bath Natural History and Antiquarian Field Club). Vol. iii., No. 3. Bath: 1876.

THE author of this work has kept a Meteorological Register since 1823, and in 1858 published (as the Rev. L. Jenyns, which name he has since change for Blomefield) an octavo volume of 400 pp., giving the results of nineteen years' observations at Swaffham Bulbeck, in Cambridgeshire; he is also the author of several works on Natural History and kindred subjects.

At the meeting of the British Association at Bath in 1864, the author made some remarks on the Climate of Bath, and as he con-

sidered that none of the meteorological records which had been kept in the town was altogether trustworthy, he proposed to the Committee of the Literary Institution that a series of observations should be made at the Institution, and this work is a discussion of the records obtained from instruments which were soon afterwards procured. The work commences with an account of the published descriptions of the Climate of Bath, which appear to be rather scanty, and refers to the very contradictory terms in which the climate is frequently spoken of. This is followed by a thorough description of the instruments, their position and exposure, which appear to be perfectly satisfactory, with the exception of the rain gauge, which is 8 ft. above ground, and the barometer an old one by Cary, the readings of which are only referred to slightly, as they are not considered satisfactory, and in 1875 it was replaced by a Fortin made by Casella.

The tables of temperature do not call for special description, but they seem complete, not only giving the means and extremes of the months and the seasons, but also a comparison with the temperatures of some half dozen other towns, from which the author concludes that Bath is warmer in winter than those towns, about the same temp. in summer, and that all through the year the variations of temperature are much less rapid, and the extremes not so great as at other places.

Rainfall, humidity, and the direction of the wind are also dwelt upon at some length, and there are several pages on ozone and the general quality of the air. The author concludes by suggesting that additional registers should be kept in different parts of the town at various altitudes—a suggestion with which we cordially agree, for few cities have probably a greater variety of climate within a radius of two miles than has Bath.

THE OAK AND THE ASH.

To the Editor of the Meteorological Magazine.

SIR,—You give in your June number a Mid-Surrey tree proverb, viz. :—

“ If the oak before the ash comes out,
There has been or there will be drought.”

Allow me to add the Cheshire version :—

“ If the oak comes out before the ash,
There'll be no water for to wash.”

which smacks much of the country housewife.—I am, yours,

EDWARD CHAPMAN.

Frewen Hall, Oxford, 30th June, 1880.

[Other versions are :—

“ If the ash is out before the oak, You may expect a thorough soak ;	If the oak is out before the ash, You'll hardly get a single splash.”
---	--

“ When the oak comes out before the ash, there will be fine weather in harvest ; but when the ash comes out before the oak, the harvest will be wet.”

“ If the oak's before the ash, Then you'll only get a splash ;	But if the ash precedes the oak, Then you may expect a soak.”
---	--

The following note appeared in *Land and Water*, on Nov. 2nd, 1872 :—

SIGNS OF RAIN.—SIR,—The subjoined extract was given to me a year ago, but I cannot tell when it was written. You will see that some of the years occur in more than one of the lists. I have marked these with (?)

When the ash comes out before the oak,
You may look for a soak.

When the oak comes out before the ash,
You may expect a splash.

In the years 1816, 17, 21, 23, 28, 29, 30, 38, 40 (?), 45, 50, and 59, the ash was in full foliage more than a month before the oak, and many of our readers will recollect the cold and unproductive seasons which succeeded. Again, in 1831, 33 (?), 39, 40 (?), 53, and 60, both these species of vegetation began their race about the same period, and the summers which followed were neither one way nor the other. Whereas in 1818, 19, 20, 22, 24, 25, 26, 27, 33 (?), 34, 35, 36, 37, 40 (?), 42, 46, 54, and 68, the oak displayed its foliage weeks before its companion of the forest, and these years were particularly distinguished for fine dry and mild weather, and subsequently by the most abundant harvest recorded.—*Mark Lane Express*.

This year the oak was in leaf at least a month before the ash. So much for the old "saw."—H. T.

One of our old rainfall correspondents, Mr. Douglas, of Babworth, Notts, once told us that "the oak is always in leaf before the ash when the subsoil is in a moist state."—ED.]

THE DRY PERIOD.

To the Editor of the Meteorological Magazine.

SIR,—The exceptional drought of the past eight months, to which Mr. Robie calls attention, has not been confined to his neighbourhood, the following figures showing the rainfall to have been still less here, at Beckenham.

Month.	Total Depth.	Number of days on which 0·01 or more fell.	Greatest Fall in 24 hours.	
1879.	inches.		Depth.	Date.
October	·541	7	·233	24th
November	1·159	12	·400 ^s	21st
December	·925	11	·382	30th
1880.				
January	·339	5	·171	16th
February	2·308	17	·488	16th
March	·542	5	·308	31st
April	1·826	12	·499	14th
May	·442	4	·250	31st
	8·082	73		

It will be noted that, excluding February and April, only 3·944 fell in the other six months, the greatest amount being ·400 (snow) on 21st November.—I am, yours faithfully,

Foxgrove, Beckenham, 17th June, 1880.

PERCY BICKNEL.

SUPPLEMENTARY TABLE OF RAINFALL IN JUNE, 1880.

[For the Counties, Latitudes, and Longitudes of most of these Stations,
see *Met. Mag.*, Vol. XIV., pp. 10 & 11.]

Div.	STATION.	Total Rain.	Div.	STATION.	Total Rain.
		in.			in.
II.	Dorking, Abinger	3·60	XI.	Corwen, Rhug	3·63
„	Margate, Acol	2·91	„	Port Madoc	4·04
„	Littlehampton	1·61	„	Douglas	2·20
„	St. Leonards	3·13	XII.	Carsphairn	2·78
„	Hailsham	2·61	„	Melrose, Abbey Gate ..	1·40
„	I. of W., St. Lawrence.	1·98	XIV.	Glasgow, Queen's Park.	2·10
„	Alton, Ashdell	2·16	XV.	Islay, Gruinart School..	2·49
III.	Great Missenden	2·23	XVI.	Cupar, Kemback	1·90
„	Winslow, Addington ..	2·26	„	Aberfeldy H.R.S.	1·61
„	Oxford, Magdalen Col...	4·18	XVII.	Tomintoul	4·79
„	Northampton	2·07	„	Keith H.R.S.	2·10
„	Cambridge, Merton Vil.	2·78	„	Forres H.R.S.	1·20
IV.	Harlow, Sheering	1·78	XVIII.	Strome Ferry H.R.S....	2·33
„	Diss	3·95	„	Auchnasheen H.R.S. ...	...
„	Swaffham	5·53	„	Lochbroom	4·50
„	Hindringham	3·23	„	Tain, Springfield	1·80
V.	Salisbury, Alderbury ...	2·09	„	Loch Shiel, Glenfinnan.	6·22
„	Calne, Compton Bassett	1·71	„	Dalwhinnie H.R.S.	...
„	Beaminster Vicarage ...	1·09	XIX.	Lairg H.R.S.	2·95
„	Dartmoor, Princetown..	...	„	Altnabreac H.R.S.	2·96
„	Langtree Wick	...	„	Watten H.R.S.	1·99
„	Lynmouth, Glenthorne.	2·27	XX.	Fermoy, Glenville	4·30
„	St. Austell, Cosgarne...	2·54	„	Tralee, Castlemorris ...	4·12
„	Taunton	1·53	„	Cahir, Tubrid	2·56
VI.	Bristol, Ashleydown ...	...	„	Tipperary, Henry St....	2·01
„	Ross	3·23	„	Newcastle West	3·04
„	Wem, Sansaw Hall.....	4·17	„	Kilrush	3·94
„	Cheadle, The Heath Ho.	2·67	„	Corofin	4·14
„	Bickenhill Vicarage ...	3·51	XXI.	Kilkenny, Butler House	1·77
VII.	Melton Mowbray	3·30	„	Carlow, Browne's Hill..	2·15
„	Horncastle, Bucknall ...	3·65	„	Kilsallaghan	2·63
VIII.	Walton-on-the-Hill.....	2·99	„	Navan, Balrath	2·23
„	Broughton-in-Furness ..	3·61	„	Athlone, Twyford	6·09
IX.	Wakefield, Stanley Vic.	2·46	„	Mullingar, Belvedere ...	3·47
„	Ripon, Mickley	1·83	XXII.	Ballinasloe	3·85
„	Scarborough	2·43	„	Clifden, Kylemore	7·84
X.	Mickleton	2·40	„	Crossmolina, Enniscoe..	3·24
„	Haltwhistle, Unthank..	3·59	„	Carrick-on-Shannon ...	2·88
„	Shap, Copy Hill	2·85	XXIII.	Dowra	5·13
XI.	Llanfrechfa Grange	2·83	„	Rockcorry	2·57
„	Llandovery	3·23	„	Warrenpoint	2·93
„	Solva	1·08	„	Newtownards	1·41
„	Castle Malgwyn	3·71	„	Carnlough	1·63
„	Rhayader, Nantgwillt..	4·65	„	Bushmills	3·19
„	Carno, Tybrite	3·88	„	Buncrana	3·66

JUNE, 1880.

Div.	STATIONS. [The Roman numerals denote the division of the Annual Tables to which each station belongs.]	RAINFALL.					Days on which .01 or more fell.	TEMPERATURE.				No. of Nights below 32°		
		Total Fall.	Difference from average 1860-5	Greatest Fall in 24 hours.		Max.		Min.	In shade.	On grass.				
				Dpth	Date.						Deg.	Date.	Deg.	Date.
I.	Camden Square.....	inches	inches.	in.										
II.	Maidstone (Hunton Court)...	4.04	+ .99	1.13	25	17	79.8	30	38.3	5	0	0		
	Strathfield Turgiss	2.30	— .42	.41	17	19	...	...	...	...	...	...		
III.	Hitchen	2.61	...	.32	22	19	75.5	29	36.0	5	0	1		
	Banbury	2.45	— .19	.42	24	19	72.0	28†	36.0	4	0	0		
IV.	Bury St. Edmunds (Culford)...	2.75	— .53	.63	22	19	75.6	29	35.0	9	0	0		
	Norwich (Cossey).....	2.52	— .06	.58	15	17	78.0	29	32.0	4	1	1		
V.	Bridport	3.58	+ 1.36	.63	23	19	77.5	22	40.0	5	0	0		
	Barnstaple.....	1.32	— 1.92	.28	13	15	...	...	...	...	...	...		
	Bodmin	1.71	— 2.41	.53	18	12	73.0	19	40.0	10†	0	...		
VI.	Cirencester	2.05	— 1.99	.58	20	17	71.0	29	42.0	12	0	0		
	Shifnal (Haughton Hall) ...	1.90	— 1.48	.34	30	12	...	...	...	...	...	...		
	Tenbury (Orleton)	3.86	+ .75	.55	24	23	72.0	29	35.0	9	0	0		
VII.	Leicester (Town Museum) ...	4.17	+ .65	1.03	17	19	74.3	29	34.8	10	0	1		
	Boston	3.80	...	.87	22	22	73.0	29	38.0	5	0	5		
	Grimsby (Killingholme)	3.95	+ 1.76	.91	19	16	80.0	29	37.0	5	0	0		
	Mansfield	1.61	...	.34	23	15	74.0	29	40.0	5, 9	0	...		
VIII.	Manchester (Ardwick).....	4.30	...	.81	22	20	74.9	29	37.3	5	0	0		
IX.	York	2.34	— .74	.38	7, 10	20	75.0	18	41.0	5	0	0		
	Skipton (Arncliffe)	...	...	...	...	...	...	...	...	...	...	...		
X.	North Shields	6.80	+ 2.70	1.67	27	25	73.0	22	33.0	8	0	...		
	Borrowdale (Seathwaite).....	1.24	— 1.50	.37	15	13	67.3	29	39.0	9, 10	0	0		
XI.	Cardiff	9.68	— .83	2.82	27	21	...	...	...	...	...	...		
	Haverfordwest	2.38	...	.53	17	19	72.1	18	41.2	10	0	0		
	Aberdovey	2.33	— 1.32	.31	19	16	74.0	17	34.5	9	0	3		
	Llandudno.....	3.84	...	.60	19	16	...	...	...	...	...	...		
XII.	Cargen	2.59	+ .30	.49	19	16	69.4	22	41.0	10	0	...		
	Hawick (Silverbut Hall)...	2.12	— 1.32	.78	29	13	76.6	18	35.6	9	0	1		
XIV.	Douglas Castle (Newmains)..	1.29	...	.32	30	12	...	...	...	...	...	...		
XVI.	Loch Long (Ardaroch)	1.87	...	.53	29	15	...	...	...	...	...	...		
	Kilmory	...	...	...	...	...	...	...	...	...	...	...		
	Mull (Quinish).....	3.17	...	.62	27	15	...	...	33.0	11	0	...		
	Loch Leven	3.42	...	.99	12	15	...	...	...	...	...	...		
XVII.	Arbroath	1.60	— 1.25	.30	28*	9	...	...	...	...	...	...		
	Braemar	1.53	— 1.00	.68	29	14	76.0	29	40.0	9	0	...		
XVIII.	Aberdeen	3.07	— .37	.90	29	18	71.0	24	33.3	11	0	0		
	Portree	2.94	...	.77	29	17	73.0	29	40.0	7	0	0		
	Inverness (Culloden)	3.25	— 1.53	.87	28	11	...	...	...	...	...	...		
XIX.	Dunrobin	1.00	— .92	.27	30	8	69.8	25	35.2	9	0	4		
	Sandwick	2.77	+ 1.20	.92	30	13	65.0	28	39.0	8	0	...		
XX.	Cork	2.30	+ .76	.59	30	15	66.0	17	40.8	5	0	2		
	Darrynane Abbey.....	2.10	...	.94	12	15	82.0	24	36.0	9	0	...		
	Waterford	...	...	...	...	...	...	...	...	...	...	...		
XXI.	Killaloe	4.82	+ 1.19	.88	20	18	80.0	24	35.0	9, 10	0	...		
	Portarlinton	2.31	— .94	.32	24	16	72.5	18	35.0	9	0	...		
XXII.	Monkstown	3.70	+ 1.09	1.26	22	16	...	...	...	...	...	...		
XXIII.	Galway	5.67	...	1.27	12	19	75.0	19	38.0	9	0	...		
	Waringstown	3.31	...	.67	23	16	78.0	17	34.0	8	0	0		
	Londonderry.....	2.91	...	.71	29	15	73.0	21	38.5	10	0	2		
	Edenfel (Omagh)	3.37	...	.63	20	22	76.0	18	29.0	9	2	...		

* And 30.

† And 29.

‡ And 11.

|| And 29.

+ Shows that the fall was above the average; — that it was below it.

METEOROLOGICAL NOTES ON JUNE.

ABBREVIATIONS.—Bar. for Barometer; Ther. for Thermometer; Max. for Maximum; Min. for Minimum; T for Thunder; L for Lightning; T S for Thunderstorm; R for Rain; H for Hail; S for Snow.

ENGLAND.

STRATHFIELD TURGISS.—The gentle rains and high temps. during the month greatly improved the crops. Haymaking commenced on 21st; wheat rather rank and uneven in places; potatoes so far good. Dog rose in flower on 1st, elder on 8th, purple foxglove on 12th, and wild thyme on 30th. Meadow brown butterfly seen on 13th, and clouded yellow butterfly on 21st.

HITCHEN.—An unsettled month, temp. below the average.

BANBURY.—TSS on 17th, 22nd, 23rd, 24th, and 25th. High wind on 5th and 7th. Wheat in bloom at end of month.

CULFORD.—Mean temp. of month $58^{\circ}0$. Polar winds prevailed on 13 days. High wind on 7th and 9th, T on 7th, 8th, 19th, 22nd, 23rd, and 24th.

COSSEY.—TSS on 7th, 8th, and 23rd.

BODMIN.—A most genial month, mean temp. $59^{\circ}1$.

CIRENCESTER.—A dry cool month generally, with a few welcome thunder-showers towards the end. Wind variable.

SHIFNAL.—R daily with three exceptions till the 26th. No "hot band" here as predicted by Mr. Brumham (*Met. Mag.*, vol. xv., p. 56). Min. ther. down to 35° on the 9th, and the max. never reaching 70° till the 17th, from that date to the close fine growing weather with T either near or distant almost daily. First strawberries gathered on 21st, first peas on 22nd. Mangold wurzel quite destroyed by a grub, the same that ruined them in 1861. Turnips, &c., not touched by them.

ORLETON.—The first half of the month was cold and damp with frequent R and rough winds, the remainder was warmer with less wind, but with frequent storms of L and T and heavy falls of R. Mean temp. rather more than $1^{\circ}5$ below the average. T was heard on 10 days, and the storms were heavy on the 17th, 19th, 24th and 25th, causing floods in the brooks.

BOSTON.—The mean temp. of the month was $2^{\circ}4$ below the average. A very heavy TS occurred on the 19th, when .89 in. of R fell in 45 minutes. In addition to very heavy T, a H storm broke over a part of this district, commencing in its full intensity just S. of Boston and travelling about 15 miles in a S.E. direction it terminated in the Wash. The H stones are described variously as being from the shape and size of a walnut to jagged pieces of ice two and three inches in length. Very great damage was done to the crops in the limited space over which it passed, the vegetation being cut off level with the ground. A very great number of chickens, ducklings, and even sea birds were killed, and many hundred panes of glass broken in the churches and houses. Wheat came into ear about the 27th; all the crops in this district look remarkably well.

GRIMSBY.—N. and N.E. winds prevailed with little intermission till the 26th, and from that date to the close of the month the weather was warm; T on 8 days. Pastures very good and corn and green crops very promising.

NORTH SHIELDS.—T on 5 days, H on 3 days.

WALES.

HAVERFORDWEST.—Cold ungenial weather prevailed up to the 11th; from the 11th to the 20th R fell in considerable quantities, principally at night; the days generally were fine and warm with plenty of sunshine; the weather from the 20th to the end was fine, sunshiny, warm, and sometimes close, but altogether everything that could be desired, and the hay crops are very good. On the 8th a heavy storm of H and sleet occurred, making the ground and hedges quite white; in exposed situations and on high land it did not melt for some hours. A severe storm occurred on the 18th; distant T had been heard all day, but it was not till about 8 p.m. that it became near; the L was forked and very vivid, but there was scarcely any R. At Milford a horse was killed by the L, and an iron boiler at Milford Docks was shattered. The storm was at its

height about 2 a.m. on the 19th. The four days from 9th to 12th inclusive were remarkably cold, the max. temp. of the period being 63°, and the min. 34°·5.

LLANDUDNO.—Weather variable and showery, but most favourable for the growth of grass, grain, and potatoes, which all look uncommonly well. Temp. rather below the average. T on five days.

SCOTLAND.

CARGEN.—Mean temp. of month 57°·7, nearly 1° above the average; amount of sunshine also above the average. T on 5 days; heavy hail shower for 20 minutes on 8th, yielding 48 in. of water.

HAWICK.—The weather during the month was dry, and E. winds prevailed. The hay crop was light, and pastures at the end of the month were almost burnt up. Potatoes look well. Great scarcity of small birds.

DOUGLAS CASTLE.—TSS on 8th, 22nd, 23rd, and 24th, and T on 21st.

BRAEMAR.—Very severe TS from noon to 4 p.m. on 22nd; the L very vivid and doing some damage to trees. T on 9th, 10th, 23rd, and 25th.

ABERDEEN.—At the beginning of the month the winds were northerly, at times attaining considerable strength; the greatest force occurred on the 4th, when a velocity of (approximately) 48 miles an hour was reached. During the latter half of the month the winds were light and variable.

PORTREE.—A dry month; bright sun during the day, and sharp air during the night. Cattle and sheep in good condition, and thriving well on the hill pastures.

CULLODEN.—Rainfall of the month small with little heat. Hay crop less than average; turnips advancing notwithstanding want of moisture.

SANDWICK.—The temperature was rather below the mean, but, never being higher than 66°, nor lower than 40°·8, and little rain, it formed as agreeable a climate as could be found perhaps in any part of Britain. There was a sun pillar for about an hour at sunset on the 24th, but the nights were far too light to allow any aurora to be seen.

IRELAND.

KILLALOE.—Abundance of R and high temp., with generally calm weather, have been the features of the weather; rapid vegetation has been the natural result, and pastures, meadows, corn, and green crops are very forward and promising.

MONKSTOWN.—A very seasonable and warm month, heavy showers alternating with bright hot sunshine; the showers were remarkably partial; T and L frequent.

WARINGSTOWN.—A very fine warm and genial month; crops flourishing. Such a luxuriant potatoe crop has not been known since 1846.

LONDONDERRY.—Wind variable, temp. higher than usual all through; month generally very mild. Growth of vegetation very rapid.

RAPID BAROMETRIC CHANGES.

To the Editor of the Meteorological Magazine.

SIR,—On page 67 of last month's magazine, in your report of the rapid rise from Rochefort of 0·41 in. in 1 hour and 30 minutes, I have herewith appended a rapid change which took place under my personal observation on the 12th March, 1876:—

Barometer.			Barometer.		
At	8 a.m.	28·30	At	5 p.m.	28·45
„	10 „	28·25	„	6 „	28·55
„	0 p.m.	28·16	„	7 „	28·64
„	2 „	28·03	„	8 „	28·73
„	3·30 „	28·00	„	9 „	28·83
„	4 „	28·25			

It will be seen that the rate of the rise was 0·30 in. per hour.—
Yours truly,

CHARLES WOOLETT, F.M.S.

Acriste, July 5th, 1880.